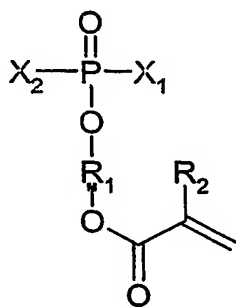


Claims:

- 5 1. A dental composition, comprising
- a) one or a mixture of phosphoric acid esters bearing substituents with one ethylenically unsaturated moiety on the phosphorus atom,
 - b) one or a mixture of phosphoric acid esters bearing substituents with two or more ethylenically unsaturated moieties on the phosphorus atom,
 - 10 c) initiators,
 - d) optionally stabilizers,
 - e) unsaturated monomers
 - f) optionally unsaturated polymers and/or prepolymers
 - g) optionally a solvent,
 - 15 h) optionally a fluoride release agent,
 - i) optionally a non reactive inorganic filler,
 - j) optionally a photobleachable colorant.
2. The dental composition according to claim 1, wherein component (a) is
- 20 represented by formula (I)



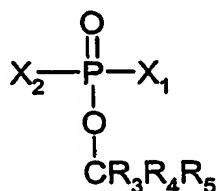
wherein R_1 = (i) alkylene having 1 to 4 C atoms, (ii) or a bivalent organic group having 1 to 4 carbon atoms composed of two or more hydrocarbon residues bonded to one another by one or more ether or thioether linkages, (iii) or aryl, each optionally substituted with OH;

5 wherein R_2 = H, CH_3 ;

wherein X_1 = OH or halogen; and

wherein X_2 = X_1 or $-O-R_1-OOC-CR_2=CH_2$,

and component (b) is represented by formula (II),



10 (II)

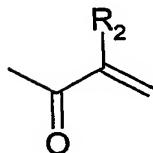
wherein R_3 , R_4 , and R_5 = (i) H, (ii) linear or branched alkyl having 1 to 4 carbon atoms, optionally substituted with OH, (iii) aryl, optionally substituted with OH, (iv) organic group having 5 to 15 carbon atoms composed of 2 to 6 saturated or ethylenically unsaturated hydrocarbon residues bonded to one another by one or more ether, thioether, ester, thioester, thiocarbonyl, amide, urethane, carbonyl and/or sulfonyl linkages, each optionally substituted with OH,

15

wherein at least 2 of the groups R_3 , R_4 , and R_5 comprise at least 1 group according to formula (III)

20 or

at least 1 of the groups R_3 , R_4 , and R_5 comprises at least 2 groups according to formula (III)



(III)

and wherein $X_2 = X_1$ or $-O-CR_3R_4R_5$ or $-O-R_1-OOC-CR_2=CH_2$.

3. The dental composition according to anyone of the preceding claims, wherein
5 component (b) is present in an amount of about 1 to about 500 parts by weight based on about 100 parts by weight of component (a).
4. The dental composition according to anyone of the preceding claims, wherein
10 the total amount of components (a) and (b) in the composition is about 10 to about 90 parts by weight.
5. The dental composition according to anyone of the preceding claims, wherein
the polymer and/or prepolymer of component (f) is present in an amount of about 0 to about 30 parts by weight.
15
6. The dental composition according to claim 5, wherein the prepolymer does not contain any hydroxy, acidic or ionic groups.
7. The dental composition according to claim 5 or 6, wherein the prepolymer has
20 an Mw in the range of about 600 to about 20000.
8. The dental composition according to anyone of the preceding claims having a contact angle versus deionized water of more than about 15° , if the composition is cured in the presence of air, and of more than about 50° , if the
25 composition is cured in the absence of air.

9. The dental composition according to anyone of the preceding claims having an adhesion to enamel and/or dentin in the range of about 2 to about 15 MPa.
- 5 10. The dental composition according to anyone of the preceding claims having a water uptake of less than about 5 % by weight with respect to the cured composition measured after having immersed the composition for 5 h in water of 37°C.
- 10 11. The dental composition according to claim 10 having an enamel adhesion of at least about 5 MPa.
- 15 12. The dental composition according to anyone of the preceding claims, wherein component (a) is selected from 2-methacryloyloxyethyl phosphate, 2-methacryloyloxypropyl phosphate, 3-methacryloyloxypropyl phosphate, 2-methacryloyloxybutyl phosphate, 3-methacryloyloxybutyl phosphate, 4-methacryloyloxybutyl phosphate, 5-methacryloyloxy-3-oxa-pentyl phosphate, bis(2-methacryloyloxyethyl) phosphate, bis(2-methacryloyloxypropyl) phosphate, bis(3-methacryloyloxypropyl) phosphate, bis(2-methacryloyloxybutyl) phosphate, bis(3-methacryloyloxybutyl) phosphate, bis(4-methacryloyloxybutyl) phosphate, bis(5-methacryloyloxy-3-oxa-pentyl) phosphate, phosphate, or mixtures thereof.
- 20 13. The dental composition according to anyone of the preceding claims, wherein component (b) is selected from glycerol-1,3-dimethacrylate-2-phosphate, glycerol-1,2-dimethacrylate-3-phosphate, bis(glycerol-1,3-dimethacrylate) phosphate, bis(glycerol-1,2-dimethacrylate) phosphate, (glycerol-1,2-dimethacrylate)(glycerol-1,3-dimethacrylate) phosphate, (trimethylolpropane dimethacrylate) phosphate, bis(trimethylolpropane dimethacrylate) phosphate, (trimethylolethane dimethacrylate) phosphate, bis(trimethylolethane
- 25

dimethacrylate) phosphate, pentaerythritol trimethacrylate phosphate or mixtures thereof.

- 5 14. Kit of parts, comprising in one part components (a), (b), (c), (d), (e), (f), (h), (i),
(j) and in another part components (c), (d), (e), (f), (g) as described in anyone
of the preceding claims.
- 10 15. Use of a dental composition according to anyone of claims 1 to 13 or the kit
according to claim 14 for the production of a material to be used for the
adhesive securing of dental filling materials based on (meth)acrylates and/or
epoxies, as self-adhesive dental pit and fissure sealants, and/or as self-
adhesive dental desensitizers.
- 15 16. Method for preparing a composition according to anyone of claims 1 to 14
comprising the step of mixing the components.